Amendments to Claims

IN THE CLAIMS

1. (Currently amended) A multi-channel, optical switch to use light bullets representing data as optical pulses, the switch comprising:

a waveguide ~~of a first material~~;

a plurality of data channels extending from the waveguide, each data channel of the plurality of data channels ~~to~~ providing~~e~~ an optical path suitable for transmitting~~ssion of the light bullets~~ a first light bullet representing data~~, each channel formed of a material other than the first material~~;
~~and wherein a first subset of the light bullets are to propagate into a predetermined channel of the plurality of channels responsive to interaction with a second subset of the light bullets;~~

a plurality of light source channels extending from the waveguide and supplementing said plurality of data channels, wherein each light source channel provide~~sing~~ an optical path suitable for transmitting~~ssion~~ ~~of~~ a second light bullet representing a control signal, wherein the second light bullet ~~for~~ direct~~sing~~ the first light bullet into one of said plurality of data channels ~~light bullets~~; and

a light source connected to the plurality of light source channels, ~~the light source to provide the second subset of light bullets,~~ wherein the light source ~~being~~ is a single source of light suitable for generating the second light bullet and for providing characteristics of the second light bullet.

2 – 5. (Cancelled)

6. (Original) The switch of claim 1, wherein:
the light bullets are to co-propagate through and interact within the waveguide to selectively direct the light bullets.

7. (Currently amended) The switch of claim 1, further comprising:
an absorption layer extending from the waveguide, the absorption layer being separate from the plurality of channels, the absorption layer to absorb light bullets representing control signals.

8. (Currently amended) The switch of claim 1, further comprising:
a controller coupled to the waveguide and coupled to the plurality of data channels, the controller to control operation of the waveguide and the plurality of data channels.

9. (Currently amended) The switch of claim 8, wherein:
the data channels of the plurality of data channels ~~may be~~are selectively disabled from transmitting light bullets; and
the controller ~~to~~ selectively disables the data channels of the plurality of data channels on an individual or group basis.

10. (Cancelled)

11. (Currently amended) The switch of claim 8, wherein:
the controller ~~is to~~ controls the light source;~~,~~
the controller ~~to~~ sets a power level of the light source, the power level of the light source corresponding to an intensity of the light bullets produced by the light source.

12. (Original) The switch of claim 8, further comprising:
a system interface coupled to the controller.

13. (Currently amended) The switch of claim 12, further comprising:
a cable interface coupled to a data channel of the plurality of data channels.

14. (Currently amended) The switch of claim 1, wherein:
the waveguide ~~first material~~ is composed from a semiconductor material.

15. (Original) The switch of claim 14, wherein:
the semiconductor material is composed essentially from a material selected from the group consisting of Gallium Arsenide (GaAs) Indium Phosphide (InP), and Gallium Nitride (GaN).

16 – 21. (Cancelled)

22. (Currently amended) The switch of claim 1, wherein:
the waveguide includes a single planar, rectangular~~ly shaped~~ slab of semiconductor material.

23. (Currently amended) The switch of claim 1, wherein:
the waveguide comprises a first material, wherein the first material is bulk material ~~to~~ provideing the light bullets with other directions of propagation, including directions of propagation out of the plane of the waveguide.

24. (Original) The switch of claim 1, wherein:
the light bullets propagate along corresponding travel paths; and
the travel paths are selectively determined by controlling the timing, intensity, and the axial displacement of the light bullets relative to each other.

25. (Original) The switch of claim 1, wherein:
the first material is a semiconductor material having a sufficiently negative group velocity dispersion and high nonlinear index of refraction to support the light bullets.

26. (Currently amended) A method of switching optical data comprising:

receiving a first light bullet representing data in a first optical data channel of a plurality of optical data channels~~, the first optical channel formed of a first material~~;

injecting the first light bullet into a waveguide~~, the waveguide formed of a second material different from the first material~~;

directing the first light bullet within the waveguide responsive to a guiding second light bullet generated by a single source of light connected to a light source channel supplementing the plurality of optical data channels;

controlling the single source of light to control the guiding second light bullet;

and

receiving the first light bullet in a ~~predetermined~~ second optical data channel.

27. (Currently amended) The method of claim 26, further comprising:
injecting the guiding second light bullet into the waveguide.

28 – 36. (Cancelled)

37. (Currently amended) A router, comprising:

a plurality of input ports;

a plurality of output ports;

a switching fabric coupled to the input ports of the plurality of input ports and coupled to the output ports of the plurality of output ports, the switching fabric including a plurality of interconnected multi-channel, optical switches, each of the optical switches to use light bullets representing data as optical pulses, each of the optical switches including:

a waveguide composed of a material, wherein the material preserves with a first level of effectiveness a first light bullet representing data;

a plurality of data channels extending from the waveguide, each data channel of the plurality of data channels to provide an optical path suitable for transmission of ~~the light bullets~~ the first light bullet~~,~~ wherein each channel is composed of an other material, wherein the other material preserves with a second level of effectiveness the first light bullet, wherein the second level of effectiveness is less than the first level of effectiveness~~each channel formed of a material other than the first material~~;

wherein ~~a~~ a ~~first~~second ~~subset of the~~ light bullet representing a control signal~~s~~ for directing the first light bullet representing data into one of said plurality of data channels ~~are~~ is transmitted through~~to propagate into~~ a ~~predetermined~~ light source channel of ~~the~~a plurality of light source channels supplementing the plurality of data channels and extending from the waveguide~~channels responsive to interaction with a second subset of the light bullets~~, the second ~~set of~~ light bullet~~s~~ being generated by a single source of light;

and wherein the optical switches of the plurality of optical switches are coupled together through the data channels of the plurality of data channels of each optical switch.

38 – 41. (Cancelled)

42. (Currently amended) A switching fabric to switch light bullets between a set of input ports and a set of output ports, comprising:

a plurality of interconnected multi-channel, optical switches, each of the optical switches to use light bullets as optical pulses, each of the optical switches including:

a waveguide of a material having a first level of quality;

a plurality of data channels extending from the waveguide, each data channel of the plurality of data channels to provide an optical path suitable for transmission of ~~the light bullets~~ a first light bullet representing data~~,~~ each channel formed of an other material having an other level of quality, wherein the other level of quality is less than the first level of quality ~~other than the first material~~;

wherein a ~~first~~ second ~~subset of the~~ light bullet~~s~~ representing a control signal for directing the first bullet representing data into one of said plurality of data channels is transmitted through~~are to propagate into~~ a ~~predetermined~~ light source channel of ~~the~~ a plurality of light source channels supplementing the plurality of data channels and extending from the waveguide, ~~responsive to interaction with a second subset of the light bullets~~the second light bullet being generated by a single source of light;

and wherein the optical switches of the plurality of optical switches are coupled together through the data channels of the plurality of data channels of each optical switch.

43 – 44. (Cancelled)

REMARKS

Applicant thanks the Examiner for the careful review of this application. Claims 2-5, 10, 16-21, 28-36, and 38-41 are cancelled. Claims 1, 6-9, 11-15, 22-27, 37 and 42 are currently pending in this application. Claims 1, 7-9, 11, 13-14, 22-23, 26-27, 37, and 42 have been amended.

For one or more embodiments, the amendments to independent claims 1, 26, 37, and 42 clarify and require that the channels extending from the waveguide be data channels, that a first light bullet represent data, and that the plurality of light source channels not be a subset of the plurality of data channels. These amendments are duly supported by the following components of embodiments described in the specification:

the data channels extending from the waveguide (e.g. spec ¶¶s 57-63 – "channels extending from the waveguide" and "channels connected to the waveguide"), the first light bullet representing data (e.g. spec ¶ 57, ¶¶s 59-63 – "data"), and light source channels augmenting or supplementing the data channels (e.g. spec ¶¶s 61, 66, 72, and 74 and Fig. 3 – "first bank [315] . . . and . . . second bank [335]" and "third side of waveguide 310 are connected three light source channels"). With further regard to the last limitation, one or more of the light source channels must be fully separate and distinct from any of the data channels in order for the one or more of the light source channels to augment, supplement, or add to the data channels. Thus, Applicant's specification as filed provides ample support for data channels extending from the waveguide, a first light bullet representing data, and distinctiveness between the plurality of light source channels and the plurality of data channels.

In contrast, all of the cited references including Goorjian (U.S. Patent 5,963,683), either alone or in combination, fail to anticipate, disclose, suggest, or make obvious one or more of the limitations of amended independent claims 1, 26, 37, and 42. By way of example and not limitation, the cited references neither anticipate nor suggest data channels extending from the waveguide, a first light bullet representing data, or distinctiveness between the plurality of light source channels and the plurality of data channels. Independent claims 1, 26, 37, and 42 are allowable for at least this reason. Therefore, the rejection of independent claims 1, 26, 37, and 42 should be withdrawn.

Dependent claims 6-9, 11-15, 22-25, and 27 are allowable because they depend on an allowable base claim, such as independent claims 1, 26, 37, and 42. Further, dependent claims 6-9, 11-15, 22-25, and 27 include features that independently render them allowable over the cited art. The rejection of dependent claims 6-9, 11-15, 22-25, and 27 should therefore be withdrawn.

CONCLUSION

Applicant believes that all pending claims are now allowable. The applicant respectfully requests that all objections and rejections be withdrawn and a Notice of Allowance be issued at the earliest possible date.

The amendment was made to expedite the prosecution of this application. Applicant respectfully traverses the rejections of the amended claims and reserves the right to re-introduce them and claims of an equivalent scope in a continuation application.

If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel at the number set out below.

Respectfully submitted,

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